



Senior Airman Candice Major performs a magnetic particle inspection on a T-38 brake part.

## Holloman's NDI Lab

# Cracks down on aircraft safety

by Airman 1st Class  
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A crack in the nose landing gear of Trans World Airlines Flight 519 prevented it from opening, forcing an emergency night landing. An air tanker fighting a Colorado forest fire erupted in flames and crashed because of a crack that started at a half-inch rivet on its left wing and spread, according to a Forest Service investigation.

Because a crack as small as a half inch can be devastating to aircraft, a Team Holloman shop performs special inspections to ensure these cracks don't go unnoticed.

The 49th Maintenance Squadron Nondestructive Inspection Lab performs inspections on parts for T-38s, F-4s, F-117s, UH-1H Helicopters, drone aircraft and material from the 46th Test Group.

"When most people think of NDI, they automatically think X-ray, but we do a large variety of inspections on all 49th Fighter Wing aircraft and miscellaneous parts," said Tech. Sgt. Shawmarie Regards, NDI superintendent.

NDI is a reliable source of expertise to detect the defects before the Air Force mission is adversely affected, she said.

"A keen eye is required in this shop

because we ensure the structural integrity of equipment items that enable the wing to accomplish its mission," Regards said.

Lab technicians conduct a variety of tests to ensure no defect is left unnoticed. These tests include seven different concepts: magnetic particle, fluorescent penetrant, eddy current, ultrasonic, bond testing, X-ray and oil analysis.

The testing involves applying various applications to test material to see if a crack indication is received, whether it's fluorescent particles, eddy current or ultrasound. The other two tests involve magnetizing the material to see if magnetic particles gather around possible cracks and X-raying the material to find cracks or foreign objects that could cause damage. The lab also tests engine oil for levels of various wear metals.

After analysis is complete, a report is generated and sent up to Air Combat Command for record keeping.

"The best part of the job can also be the most challenging, because while it's a privilege to work with the various units around the base, it's sometimes challenging to keep all 11 members of our shop proficient on the inspections required on the six different airframes we support," Regards said.

NDI technicians attend a 13-week technical school at Naval Air Station

Pensacola, Fla., to ensure they're trained to perform all of these inspections efficiently on airframes including the six different types Holloman supports.

"Every test we do is meaningful, because it directly pertains to the wing's ability to accomplish our mission," she said. "We save equipment, which saves money and ultimately, might save a life."



Senior Airman Candice Major examines a T-38 brake part under a black light for cracks during a liquid penetrant process.

## Inside the story ...

- **Ultrasonic testing** is when ultrasonic sound waves are induced into a part or test material; through this process we are able to determine part integrity.

- **Fluorescent Penetrant** is fluorescent oil based liquid applied to a part to see if there are any defects open to the surface, if so the penetrant will allow the crack to be visible under a black light.

- **Magnetic particle** inspection is

when AC or DC current is induced into a part, magnetizing it, attracting the particles to the defect, and allowing us to look for surface or subsurface cracks.

- **Eddy current** is when an electromagnetic field is induced into a part allowing technicians to locate surface or subsurface cracks and check for heat damage within the part.

- **Radiography** is when we X-ray a part or aircraft taking an "internal" picture of the aircraft structure. We are

able to locate moisture, FOD, stress cracks and corrosion through this technique.

- **Bond testing** is used to ensure there is no internal separation of the honeycomb materials on the aircraft.

- **Oil analysis** is used to monitor the aircraft engine oil for microscopic wear metals to determine if there is internal components going bad within the engine which could cause catastrophic failure.



Staff Sgt. Roland Hernandez sets up the X-ray tube head for an F-4 fuel manifold.



Gordon Benton inspects the film of a wing attached rib for cracks and foreign object damage.



Senior Airman Lucy Montoya aims the X-ray laser on an F-4 fuel manifold.